

Patent Claims

1. Method for fabricating finely patterned interconnects having low electrical resistance, having the following steps:

a) formation of a finely patterned metal-containing interconnect (5A) having a first grain size on a carrier material (1, 2, 3, 4), characterized by the further steps:

b) production and movement of a locally delimited thermal region (W) in the finely patterned metal-containing interconnect (5A) in such a way that a recrystallization of the interconnect (5A) is carried out for the purpose of producing an interconnect (5C) having a second grain size, which is enlarged with respect to the first grain size.

2. Method according to Patent Claim 1, characterized in that the finely patterned interconnects (5, 5A, 5C) have feature sizes of less than 0.2 μm .

3. Method according to Patent Claim 1 or 2, characterized in that, in step a), the interconnects (5) are formed in a primary direction (x) and/or in a secondary direction (y), which is essentially perpendicular to the primary direction; and in step b), the movement of the thermal region (W) is carried out essentially in the primary direction (x) and/or in the secondary direction (y) or at an angle of 45 degrees to the primary and secondary direction (x, y).

4. Method according to one of Patent Claims 1 to 3, characterized in that step b) is carried out repeatedly.

5. Method according to one of Patent Claims 1 to 4, characterized in that, in step b), the locally delimited thermal region (W) is produced by means of a fanned-out laser beam, a hot gas, a multiplicity of heating lamps and/or a heating wire.
6. Method according to one of Patent Claims 1 to 5, characterized in that the locally delimited thermal region (W) is formed in strip-type or point-type fashion.
7. Method according to one of Patent Claims 1 to 6, characterized in that, in step a), the interconnects (5) have a metal alloy or a doped metal with an impurity proportion of less than 5%.
8. Method according to one of Patent Claims 1 to 7, characterized in that the carrier material has a diffusion barrier layer (3) and/or a seed layer (4).
9. Method according to one of Patent Claims 1 to 8, characterized in that, in step a), a damascene method is carried out.
10. Method according to one of Patent Claims 1 to 9, characterized in that the locally delimited thermal region (W) has a temperature of 150 degrees Celsius to 450 degrees Celsius.
11. Method according to one of Patent Claims 1 to 10, characterized in that the recrystallization is carried out in a protective gas atmosphere.